Please type a plus sign (+) inside this box → ☒**TRANSMITTAL  
FORM**

(to be used for all correspondence after initial filing)

<b>TRANSMITTAL FORM</b> (to be used for all correspondence after initial filing)	<b>Application Number</b>	10/633,764	
	<b>Filing Date</b>	August 4, 2003	
	<b>First Named Inventor</b>	Chang	
	<b>Group Art Unit</b>	1772	
	<b>Examiner Name</b>	Sandra M. Nolan	
<b>Total Number of Pages in This Submission</b>		<b>Attorney Docket Number</b>	4022-000009

**ENCLOSURES (check all that apply)**

<input checked="" type="checkbox"/> Fee Transmittal Form  <input checked="" type="checkbox"/> Fee Attached  <input type="checkbox"/> Amendment / Response  <input type="checkbox"/> After Final  <input type="checkbox"/> Affidavits/declaration(s)  <input type="checkbox"/> Extension of Time Request  <input type="checkbox"/> Express Abandonment Request  <input type="checkbox"/> Information Disclosure Statement  <input type="checkbox"/> Certified Copy of Priority Document(s)  <input type="checkbox"/> Response to Missing Parts/ Incomplete Application  <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application)  <input type="checkbox"/> Drawing(s)  <input type="checkbox"/> Licensing-related Papers  <input type="checkbox"/> Petition  <input type="checkbox"/> Petition to Convert to a Provisional Application  <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address  <input type="checkbox"/> Terminal Disclaimer  <input type="checkbox"/> Request for Refund  <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance Communication to Group  <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences  <input checked="" type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)  <input type="checkbox"/> Proprietary Information  <input type="checkbox"/> Status Letter  <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): <b>Return Postcard</b>
<b>Remarks</b>		<b>The Commissioner is hereby authorized to charge any additional fees that may be required under 37 CFR 1.16 or 1.17 to Deposit Account No. 08-0750. A duplicate copy of this sheet is enclosed.</b>

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

<b>Firm or Individual name</b>	Harness, Dickey & Pierce, P.L.C.	<b>Attorney Name</b>	Anna M. Budde	<b>Reg. No.</b>	35,085
<b>Signature</b>	<i>Anna M Budde</i>				
<b>Date</b>	October 30, 2006				

**CERTIFICATE OF MAILING/TRANSMISSION**

I hereby certify that this correspondence is being deposited with the United States Postal Service as express mail in an envelope addressed to: Director of the U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450, or facsimile transmitted to the U.S. Patent and Trademark Office on the date indicated below.			
<b>Typed or printed name</b>	Anna M. Budde	<b>Express Mail Label No.</b>	EV 757 778 233 US (10/30/2006)
<b>Signature</b>	<i>Anna M Budde</i>	<b>Date</b>	October 30, 2006

EV 757 778 233 US



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# FEE TRANSMITTAL for FY 2006

Effective 2/8/2006. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ ) 500

## Complete if Known

Application Number 10/633,764  
Filing Date August 4, 2003  
First Named Inventor Yihua CHANG et al.  
Examiner Name Miggins  
Art Unit 1772  
Attorney Docket No. 4022-000009

### METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit Account Number 08-0750

Deposit Account Name Harness, Dickey & Pierce, PLC

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments  
☐ Charge any additional fee(s) during the pendency of this application  
☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

### FEE CALCULATION

#### 1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1011	300	2011	150	Utility filing fee	
1012	200	2012	100	Design filing fee	
1013	200	2013	100	Plant filing fee	
1014	300	2014	150	Reissue filing fee	
1005	200	2005	100	Provisional filing fee	

SUBTOTAL (1) (\$ ) 0

#### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

		Extra Claims	Fee from below	Fee Paid
Total Claims	-20 ** =	0	X	0
Independent Claims	-3 ** =	0	X	0
Multiple Dependent				0

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	50	2202	25	Claims in excess of 20
1201	200	2201	100	Independent claims in excess of 3
1203	360	2203	180	Multiple dependent claim, if not paid
1204	200	2204	100	** Reissue independent claims over original patent
1205	50	2205	25	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ ) 0

\*\*or number previously paid, if greater; For Reissues, see above

### FEE CALCULATION (continued)

#### 3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	120	2251	60	Extension for reply within first month	
1252	450	2252	225	Extension for reply within second month	
1253	1020	2253	510	Extension for reply within third month	
1254	1,590	2254	795	Extension for reply within fourth month	
1255	2,160	2255	1080	Extension for reply within fifth month	
1401	500	2401	250	Notice of Appeal	500
1402	500	2402	250	Filing a brief in support of an appeal	
1403	1000	2403	500	Request for oral hearing	
1452	500	2452	250	Petition to revive - unavoidable	
1453	1500	2453	750	Petition to revive - unintentional	
1462	400	1462	400	Petition fee under 37 CFR 1.17(f)	
1463	200	1463	200	Petition fee under 37 CFR 1.17(g)	
1464	130	1464	130	Petition fee under 37 CFR 1.17(h)	
1807	50	1807	50	Processing fee under 37 CFR 1.17 (q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	

Other fee (specify) \_\_\_\_\_

\*Reduced by Basic Filing Fee Paid SUBTOTAL (3) (\$ ) 500

#### 4. SEARCH/EXAMINATION FEES

1111	500	2111	250	Utility Search Fee	
1112	100	2112	50	Design Search Fee	
1113	300	2113	150	Plant Search Fee	
1114	500	2114	250	Reissue Search Fee	
1311	200	2311	100	Utility Examination Fee	
1312	130	2312	65	Design Examination Fee	
1313	160	2313	80	Plant Examination Fee	
1314	600	2314	300	Reissue Examination Fee	

SUBTOTAL (4) (\$ ) 0

### SUBMITTED BY

### Complete (if applicable)

Name (Print/Type) Anna M. Budde Registration No. (Attorney/Agent) 35,085 Telephone (248) 641-1600  
Signature Anna M Budde Date October 30, 2006



10-31-06

JPW 8/1  
AT  
PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No.: 10/633,764  
Filing Date: August 4, 2003  
Applicants: Yihua Chang et al.  
Group Art Unit: 1772  
Examiner: Michael C. Miggins  
Title: Membranes with Fluid Barrier Properties and Articles  
Containing Such Membranes  
Docket No : 4022-000009

---

Director of the United States Patent and Trademark Office  
Board of Patent Appeals and Interferences  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

**Appeal Brief Under 37 C.F.R. § 41.37**

Sir:

This is an appeal from the Office Action mailed August 22, 2006,  
finally rejecting claims 1, 4-28, and 30-54. A Notice of Appeal was mailed on  
August 30, 2006 appealing all of the rejected claims. This Appeal Brief is due on  
October 30, 2006.

This Brief is accompanied by the fee under 37 C.F.R. § 41.20(b)(2).

## Table of Contents

Real Party in Interest . . . . .	1
Related Appeals and Interferences . . . . .	1
Status of Claims . . . . .	1
Status of Amendments . . . . .	1
Summary of Claimed Subject Matter . . . . .	2
Grounds of Rejection to Be Reviewed on Appeal . . . . .	3
Argument . . . . .	4
I. Claims 1 and 4-27 are patentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541. . . . .	4
II. Claims 28 and 30-54 are patentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541, Fibiger, WO 00/47657, and Bagrodia, WO 01/92388 A2. . . . .	6
III. Claims 1, 4-28, and 30-54 are patentable over US Application 09/704,881 in view of Frisk, U.S. Patent No. 6,117,541. . . . .	7
Conclusion . . . . .	8
Appendices . . . . .	9
Claims Appendix	
Evidence Appendix	
Related Proceedings Appendix	

### **Real Party in Interest**

The real party in interest is Nike, Inc., a corporation of the State of Oregon, to which the inventors assigned all rights in this invention. The assignment was recorded in the United States Patent and Trademark Office on August 4, 2003 at reel 014371, frame 0890.

### **Related Appeals and Interferences**

There are no related appeals or interferences.

### **Status of Claims**

Claims 1, 4-28, and 30-54, are pending in the application and stand finally rejected. This appeal is taken as to all of the rejected claims, claims 1, 4-28, and 30-54.

### **Status of Amendments**

No amendment was filed after the final rejection.

### **Summary of Claimed Subject Matter**

Applicants claim in independent claim 1 a resilient membrane comprising an elastomeric material, a polymeric fluid barrier material, and a laminar nano-filler. A “membrane” is a free-standing film separating one fluid from another. Page 5, paragraph 10, lines 1-4. The elastomeric material provides resiliency and dimensional stability to the membrane, while the polymeric fluid barrier material prevent transfer of a fluid through the membrane. Page 4, paragraph 8, lines 8-11. The laminar nano-filler has average platelet thickness of up to about 10 nanometers, an average aspect ratio of at least about 200, and at least one of height and width of from about 0.1 micron to about 1.5 microns to achieve improved barrier properties without reduced resilience or increased opacity or haziness. Page 4, paragraph 8, lines 11-14. The amount and size of the nano-filler flake allow it to improve gas barrier properties and toughness without substantially affecting the clarity of the membrane. Page 21, paragraph 44, lines 2-9.

Claims 4-12 depend on claim 1.

Independent claim 13 is similar to claim 1 but specifies that at least one elastomeric layer comprises the elastomeric material and at least one barrier layer comprises the polymeric fluid barrier material. The nano-filler is in the barrier layer. Page 7, paragraph 19, lines 5-12.

Claims 14-27 depend on claim 13.

Independent claim 28 claims a bladder comprising an elastomeric barrier membrane. The membrane has a microlayer polymeric composite layer having at least about 10 microlayers, each microlayer individually being up to about 100 microns thick, said microlayers alternating between at least one polymeric gas barrier material and at least one elastomeric material. The microlayers of polymeric fluid barrier material or the microlayers of elastomeric material, or both, comprise a laminar nano-filler as described for claim 1. Page 28, paragraph 58, lines 1-3 & paragraph 59, lines 1-2. Figures 1 and 2 illustrate membranes having a microlayer polymeric composite layer 16 and 124. The microlayer polymeric composite layer is particularly aided by including the nano-filler because the process of forming the microlayers tends to align the nano-

filler generally parallel to the faces of the microlayer polymeric composite layer. Page 26, paragraph 56. The microlayer polymeric composite layer is described in more detail at page 23, paragraph 49 through page 25, paragraph 53. The membrane can include other layers in addition to the microlayer polymeric composite layer. Page 26, paragraph 55.

Claims 30-54 depend on claim 28.

### **Grounds of Rejection to Be Reviewed on Appeal**

Claims 1-27 stand rejected under 35 U.S.C. 102(b) as unpatentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541. Appellants have cancelled claims 2 and 3.

Claims 28-54 stand rejected under 35 U.S.C. 103(a) as unpatentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541 and further in view of Fibiger, WO 00/47657 and Bagrodia, WO 01/92388 A2. Appellants have cancelled claim 29.

Claims 1-54 stand provisionally rejected for obviousness-type double patenting over claims 20-25 of US Application 09/704,881 in view of Frisk, U.S. Patent No. 6,117,541. Appellants have cancelled claims 2, 3, and 29.

### Argument

**I. Claims 1 and 4-27 are patentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541.**

The rejection fails to state a prima facie case of obviousness because the Frisk patent teaching that incorporating its nanometer-size clay particles increases stiffness of an article would lead one away from adding such material to the Watkins membrane, which must be elastic.

The Frisk patent teaches incorporating nanometer size clay particles I into a polyolefin food package. Column 1, lines 16-20; column 2, lines 16-25. The Frisk patent discloses, "In addition to enhancing the barrier properties of containers the clay platelets also enhance the heat stability and mechanical properties of the container. . . . The integrated clay platelets also *increase the stiffness* of the container . . . . Therefore, even small weight percentages of the clay material relative to the polymer material provide substantial increases in the impermeability of the integrated polyolefin layer, and in the overall properties of the container." Column 4, lines 13-28 (emphasis added; reference numerals omitted). The Frisk patent, while including its nanometer size clay platelets for enhanced barrier properties, also acknowledges that including its nanometer size clay platelets also substantially increases the stiffness of its container. Thus, the Frisk patent teaches away from so modifying articles for which increased stiffness is undesirable.

The Watkins publication teaches that flexibility is needed for its membranes, which function as gas-filled shoe cushioning bladders. Page 3, lines 19-24; page 15, lines 27-35. A person of ordinary skill in the art who desired to make a resilient membrane, as described in the Watkins publication, would not turn to the Frisk teachings because the Frisk patent specifically teaches that including its clay platelets will substantially increase the stiffness of the material,



even when added in small amounts. Thus, one of ordinary skill in the art would be led away from making the present invention by the teachings of the Frisk patent. It is well-settled that a reference that teaches away an invention cannot make it obvious. “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553, 31 U.S.P.Q.2d 1130, 1131 (Fed. Cir. 1994).

The Office Action mailed January 12, 2006<sup>1</sup> argues that “Frisk only briefly discusses the stiffening effect” and the “overwhelming purpose of adding the platelets is to increase the gas barrier properties of the film.” Still, “barely” mentioned or not, overwhelming purpose or not, the Frisk patent *as a whole* teaches that its filler stiffens an article when added and teaches away from making such a modification should one desire to avoid such increased stiffness. The Office Action tries to read into the Frisk reference a distinction between how much of the clay platelets is need for increased barrier properties and how much will give increased stiffness. The discussion of this property in the Frisk patent, however (quoted above) simply does not countenance such a distinction; it teaches that the disclosed changes all occur at even small weight percentages of the clay (“*and* in the overall properties of the container”) (emphasis added).

Applicants avoid such stiffening by limiting size of nano-filler and amount (claims 1 and 13, “wherein the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane”).

---

<sup>1</sup> For some reason, the final Office Action mailed August 22, 2006 does not mention or discuss the rejections or art of record. Consequently, all of our references will be to the preceding Office Action mailed in January 2006.

For these reasons, Appellants respectfully submit that claims 1 and 4-27 are patentable over the cited references, and request this Honorable Board to REVERSE the rejection over Watkins, WO 02/36196A1 in view of Frisk, U.S. Patent 6,117,541 and further in view of Fibiger et al., WO 00/47657 and Bagrodia et al., WO 01/92388A2.

**II. Claims 28 and 30-54 are patentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541, Fibiger, WO 00/47657, and Bagrodia, WO 01/92388 A2.**

The combination of references teaches away from Appellants' invention, as Appellants' bladder comprises an elastomeric barrier membrane in which the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane, while the Frisk patent on which the rejection relies for teaching a nanometer size clay teaches that including its filler stiffens an article. Further, the combination of references fails to teach or suggest each and every limitation of the invention claimed in claims 28 and 30-54, as none of the references teaches a membrane having as a layer a microlayer polymeric composite material in which a laminar nano-filler is in microlayers of polymeric fluid barrier material.

First, the combination of the Watkins publication and the Frisk patent fail to suggest certain aspects of the bladder having an elastomeric membrane, as discussed above. Neither the Fibiger publication or the Bagrodia publication would overcome the firm teaching of the Frisk patent that including its clay nanofiller stiffens an article, a result unacceptable where resiliency is paramount.

Second, the Fibiger and Bagrodia references have been cited as disclosing articles of 10 or more layers; claims 28 and 30-54, however, are directed to membranes that include one layer of a *microlayer* polymeric composite, as described in Appellants' specification at paragraphs 49-53 on pages 23-25.

For these reasons, Appellants respectfully submit that claims 28 and 30-54 are patentable over the cited references, and request this Honorable Board to REVERSE the rejection over Watkins, WO 02/36196A1 in view of Frisk, U.S. Patent 6,117,541,

**III. Claims 1, 4-28, and 30-54 are patentable over US Application 09/704,881 in view of Frisk, U.S. Patent No. 6,117,541.**

Applicants respectfully submit that, as argued above, the Frisk patent teaches away from including its clay platelets in a resilient or elastomeric membrane.

Claims 20-25 of copending application 09/704881 provide a laminate formed by a method for improving interlayer adhesion by forming a laminate with adjacent thermoplastic elastomer and thermoplastic polymeric barrier layers, then annealing the laminate at a temperature above a thermal transition temperature of a polymeric component in one of the layers. It would not have been obvious to incorporate the filler of the Frisk reference into the laminate of Application No. 09/704881 because the Frisk reference does not suggest that its filler has any effect on improved adhesion between adjacent layers of a laminate membrane.

Furthermore, the present claims are to a resilient membrane, while the Frisk reference teaches that incorporating its clay platelets increases stiffness, thus teaching away for both resilient layers and incorporating clay into layers if resiliency is desired. Thus, one skilled in the art would

be led away from combining the teaching of the Frisk patent with a laminate formed by a method of Application No. 09/704881 if one desired a resilient membrane.

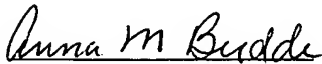
Finally, neither reference suggests the subject matter of claims 28 and 30-54, having a microlayer polymeric composite layer.

Thus, for all these reasons, Appellants respectfully submit that a prima facie case of obviousness-type double patenting is not shown from these references and request this Honorable Board to REVERSE the rejection,

#### Conclusion

The present claims are patentable over the cited art. Applicants, therefore, respectfully petition this Honorable Board to reverse the final rejection of the claims on each ground and to indicate that all claims are allowable.

Respectfully submitted,

  
Anna M. Budde  
Registration No. 35,085

October 30, 2006  
Harness, Dickey & Pierce, P.L.C.  
P.O. Box 828  
Bloomfield Hills, Michigan 48303  
(248) 641-1600

## Claim Appendix

### *Copy of the Claims Appealed*

1. A resilient membrane, comprising an elastomeric material and a polymeric fluid barrier material comprising a laminar nano-filler having an average platelet thickness of up to about 10 nanometers, an average aspect ratio of at least about 200, and at least one of height and width being independently from about 0.1 micron to about 1.5 microns, wherein the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane.
2. (cancelled)
3. (cancelled)
4. A membrane according to claim 1, wherein the elastomeric material is selected from the group consisting of polyurethane elastomers, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, ester-ether and ester-ester elastomers, flexible ionomers, thermoplastic vulcanizates, flexible poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof.
5. A membrane according to claim 1, wherein the elastomeric material is selected from the group consisting of thermoplastic polyester-polyurethanes, thermoplastic polyether-polyurethanes, thermoplastic polycarbonate-polyurethanes, and combinations thereof.
6. A membrane according to claim 1, wherein the polymeric fluid barrier material is selected from the group consisting of ethylene-vinyl alcohol copolymers, poly(vinyl chloride), polyvinylidene polymers and copolymers, polyamides, acrylonitrile polymers, polyurethane engineering plastics, poly(methyl pentene) resins, ethylene-carbon monoxide copolymers, liquid crystal polymers, polyesters, polyimides, and combinations thereof.

7. A membrane according to claim 1, wherein the polymeric fluid barrier material comprises an ethylene-vinyl alcohol copolymer.
8. A membrane according to claim 1, wherein the laminar nano-filler has an average thickness of from about 1 nm to about 10 nm and an aspect ratio from about 200 to about 1000.
9. A membrane according to claim 1, wherein the laminar nano-filler is a montmorillonite clay.
10. A membrane according to claim 1, wherein the membrane comprises from about 4 to about 10 weight percent of the laminar nano-filler.
11. A permanently sealed, inflated bladder comprising a membrane according to claim 1.
12. A permanently sealed, inflated bladder comprising a membrane according to claim 2.
13. A resilient membrane, comprising at least one elastomeric layer comprising an elastomeric material and at least one barrier layer comprising a polymeric fluid barrier material and that further comprises a laminar nano-filler having an average platelet thickness of up to about 10 nanometers, an average aspect ratio of at least about 200, and at least one of height and width being independently from about 0.1 micron to about 1.5 microns, wherein the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane.
14. A membrane according to claim 13, wherein the elastomeric material is selected from the group consisting of polyurethane elastomers, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, ester-ether and ester-ester elastomers, flexible

ionomers, thermoplastic vulcanizates, flexible poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof.

15. A membrane according to claim 13, wherein the elastomeric material is selected from the group consisting of thermoplastic polyester-polyurethanes, thermoplastic polyether-polyurethanes, thermoplastic polycarbonate-polyurethanes, and combinations thereof.

16. A membrane according to claim 13, wherein the polymeric fluid barrier material is selected from the group consisting of ethylene-vinyl alcohol copolymers, poly(vinyl chloride), polyvinylidene polymers and copolymers, polyamides, acrylonitrile polymers, polyurethane engineering plastics, poly(methyl pentene) resins, ethylene-carbon monoxide copolymers, liquid crystal polymers, polyesters, polyimides, and combinations thereof.

17. A membrane according to claim 13, wherein the polymeric fluid barrier material comprises an ethylene-vinyl alcohol copolymer.

18. A membrane according to claim 13, wherein the laminar nano-filler has an average thickness of from about 1 nm to about 10 nm and an aspect ratio from about 200 to about 1000.

19. A membrane according to claim 13, wherein the laminar nano-filler is a montmorillonite clay.

20. A membrane according to claim 13, wherein the membrane comprises from about 4 to about 10 weight percent of the laminar nano-filler.

21. A permanently sealed, inflated bladder comprising a membrane according to claim 13.

22. A permanently sealed, inflated bladder comprising a membrane according to claim 15.
23. A permanently sealed, inflated bladder comprising a membrane according to claim 17.
24. A permanently sealed, inflated bladder comprising a membrane according to claim 18.
25. A permanently sealed, inflated bladder comprising a membrane according to claim 20.
26. A bladder according to claim 21, wherein said bladder is inflated with a gas comprising nitrogen.
27. A bladder according to claim 24, wherein said bladder is inflated with a gas comprising nitrogen.
28. A bladder, comprising an elastomeric barrier membrane, wherein:  
said membrane comprises a microlayer polymeric composite layer having at least about 10 microlayers, each microlayer individually being up to about 100 microns thick, said microlayers alternating between at least one polymeric gas barrier material and at least one elastomeric material;  
and further wherein said microlayers of polymeric fluid barrier material comprise a laminar nano-filler having an average platelet thickness of up to about 10 nanometers, an average aspect ratio of at least about 200, and at least one of height and width being independently from about 0.1 micron to about 1.5 microns, wherein the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane.
29. (cancelled)



30. A bladder according to claim 28, wherein said elastomeric material comprises a member selected from the group consisting of polyurethane elastomers, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, ester-ether elastomers, ester-ester elastomer, flexible ionomers, thermoplastic vulcanizates, flexible poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof.

31. A bladder according to claim 28, wherein said elastomeric material includes a polyurethane elastomer.

32. A bladder according to claim 28, wherein said elastomeric material includes a member of the group consisting of thermoplastic polyester diol-based polyurethanes, thermoplastic polyether diol-based polyurethanes, thermoplastic polycaprolactone diol-based polyurethanes, thermoplastic polytetrahydrofuran diol-based polyurethanes, thermoplastic polycarbonate diol-based polyurethanes, and combinations thereof.

33. A bladder according to claim 32, wherein the elastomeric material comprises a thermoplastic polyester diol-based polyurethane.

34. A bladder according to claim 33, wherein the polyester diol of said polyurethane is a reaction product of a mixture comprising at least one dicarboxylic acid, dicarboxylate ester, or anhydride selected from the group consisting of adipic acid, glutaric acid, succinic acid, malonic acid, oxalic acid, anhydrides of these acids, and mixtures thereof and at least one diol selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, tetrapropylene glycol, 1,3-propanediol, 1,4-butanediol, neopentyl glycol, 1,5-pentanediol, 1,6-hexanediol, and mixtures thereof.

35. A bladder according to claim 28, wherein the fluid barrier material comprises a member selected from the group consisting of ethylene vinyl alcohol copolymers, polyvinylidene chloride, acrylonitrile copolymers, polyethylene terephthalate, polyamides, crystalline polymers, polyurethane engineering thermoplastics, and combinations thereof.
36. A bladder according to claim 28, wherein the fluid barrier material comprises an ethylene-vinyl alcohol copolymer.
37. A bladder according to claim 28, wherein said microlayer polymeric composite includes at least about 50 microlayers.
38. A bladder according to claim 28, wherein said microlayer polymeric composite includes from about 10 microlayers to about 1000 microlayers.
39. A bladder according to claim 28, wherein said microlayer polymeric composite layer includes from about 50 microlayers to about 500 microlayers.
40. A bladder according to claim 28, wherein the average thickness of each fluid barrier material microlayer is independently from about 0.01 micron to about 2.5 microns thick.
41. A bladder according to claim 28, wherein the average thickness of the microlayer polymeric composite layer is from about 75 microns to about 0.5 centimeter.
42. A bladder according to claim 28, wherein said membrane further comprises at least one layer including an elastomeric polyurethane.

43. A bladder according to claim 42, wherein said membrane comprises further layers including an elastomeric polyurethane adjacent to either side of the microlayer polymeric composite layer.
44. A bladder according to claim 28, wherein the bladder is inflated with a gas.
45. A bladder according to claim 28, wherein said bladder is inflated with a gas comprising nitrogen.
46. A bladder according to claim 44, wherein the inflating gas is at a pressure of at least about 3 psi.
47. A bladder according to claim 28, wherein the bladder is permanently sealed.
48. A bladder according to claim 29, wherein the laminar nano-filler has an average thickness of from about 1 nm to about 10 nm and an aspect ratio from about 200 to about 1000.
49. A bladder according to claim 29, wherein the laminar nano-filler is a montmorillonite clay.
50. A bladder according to claim 29, wherein the membrane comprises from about 4 to about 10 weight percent of the laminar nano-filler.
51. A shoe, comprising at least one bladder according to claim 28.
52. A shoe according to claim 51, wherein the bladder is incorporated as a portion of said sole.
53. A shoe according to claim 51, wherein said bladder forms at least a part of an outer surface of said shoe.

54. A ball, comprising a bladder according to claim 28.

## EVIDENCE APPENDIX

Evidence entered by examiner and relied on by appellant

none.

RELATED PROCEEDINGS APPENDIX

None.